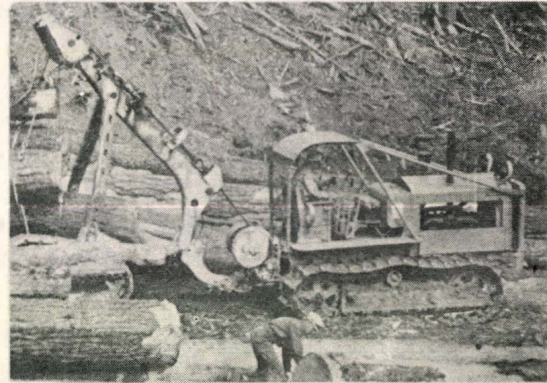
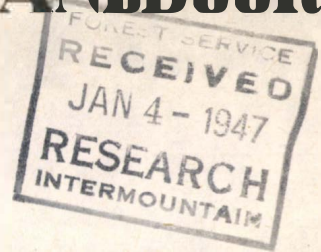


NORTHEASTERN LOGGERS' HANDBOOK

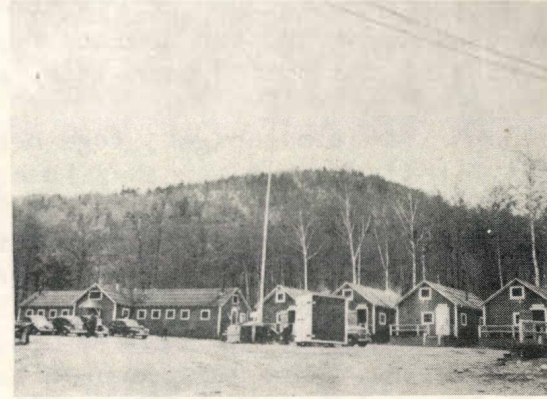
by

Fred C. Simmons

PRELIMINARY REVIEW EDITION



Easier and Safer Work



Greater Production (more pay) and Better Living Conditions

SECTION I: — HOW TO CHOOSE AND USE YOUR AXE

NORTHEASTERN FOREST
EXPERIMENT STATION



United States Department of Agriculture

FOREST SERVICE
NORTHEASTERN FOREST EXPERIMENT STATION

614 Bankers Securities Building
Philadelphia 7, Pennsylvania

V. L. HARPER, DIRECTOR

FOREST UTILIZATION SERVICE
James C. Rettie, Chief

If you want to be a mechanic, you will easily find plenty of good books which will tell you what you need to know. You will also find plenty of instructors and training shops.

What about the young man who wants to make his living by logging? For him there is no good source of information to which he can turn. The books and courses on logging are for the logging engineers--not for the fellow who uses the axe and crosscut.

Why shouldn't there be a simple illustrated handbook which will tell the young woodsman (or the green woodsman) what he needs to know about the care and use of his tools and the best of the old and the new techniques of, and devices for logging? He needs to know the "tricks of the trade" as much as anyone.

We hope that these pages, together with other short papers like it, will finally be put together in a printed NORTHEASTERN LOGGERS' HANDBOOK. We are putting it out in this form first because there seems to be an urgent need for this sort of information; and because we need the help and advice of persons who know about logging in our region before printing. We want the experienced logger to tell us what important things we have missed and where our advice is not good. We want the young man going into the woods for the first time to tell us what parts of it he finds hard to understand, to suggest how it can be made more useful to him. We would like the equipment manufacturers to check our recommendations for use of their products and tell us about new devices they are developing.

Please send criticisms, questions and suggestions to: The Director, Northeastern Forest Experiment Station, 614 Bankers Securities Building, Philadelphia 7, Penna. Additional copies of this and other publications in this series can be obtained from the same address.

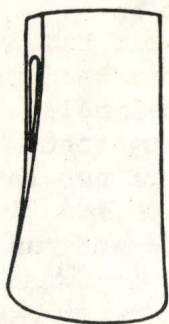
HOW TO CHOOSE AND USE YOUR AXE ^{1/}

By Fred C. Simmons*

The axe is probably the most important of all the tools that the logger uses. Time studies made in the north woods show that the pulpwood cutter uses his axe almost half of his working time. The sawlog cutter uses his about one-third of his working time. It is therefore important that the woodsman have an axe that is well suited to the work which he is doing, that it be kept in good cutting condition, and that he know how to use it.

There are something like a hundred different patterns and weights of axes in use. Ten patterns popular in the northeast are shown in the following sketches:

SINGLE BITS



NEW
ENGLAND or
CONNECTICUT



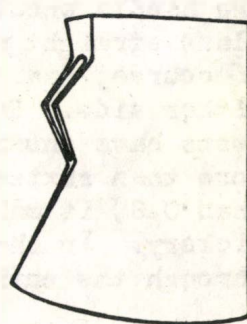
YANKEE or
DAYTON



MICHIGAN



MAINE

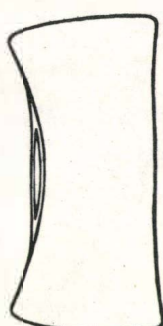


JERSEY

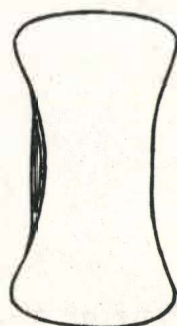
DOUBLE BITS



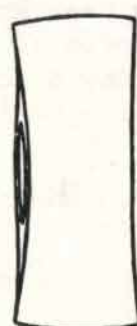
MICHIGAN



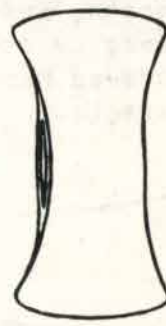
PENNSYLVANIA
or WESTERN



REVERSIBLE



WEDGE



SWAMPING

^{1/} Revised March, 1946.

*Specialist on Logging and Milling.

Choice of axe pattern is largely a matter of local habit and individual preference. In general, the wider blades are better suited for use with softwoods and the narrower ones for hardwoods. But any one of them will do good work after a man is used to it. The important things to keep in mind in choosing an axe are the quality of its head, the quality of its handle, and the way the two are joined together.

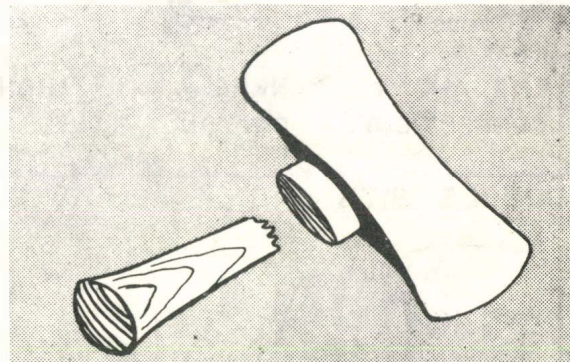
Quality of Steel

The head should be of properly forged and tempered steel--not too hard nor too soft. The top grade axe of all reputable manufacturers will meet this requirement. Some of the cheaper grades do not. The difference between the cost of the best tool and a poorer one is easily justified from the standpoint of the logger. Recent developments in the arts of smelting, forging and tempering steels have made it possible to turn out good axes consistently from one piece of steel.

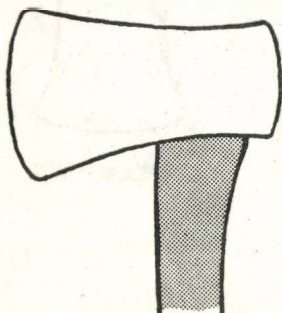
Quality of Handle

The handle should be perfectly straight so that it will line up in a plane straight with the cutting edge of the blade. The single-bit handle, of course, has certain up-and-down curve in it, but it should not bend to either side. Rapid-growth hickory is the favorite wood for axe handles. Tests have shown that so long as this wood has the proper density (not more than sixteen growth rings to the inch or specific gravity of not less than 0.8) it makes little difference whether the wood is white or red hickory. In the best handle the rings are parallel to the blade and run through the entire length of the handle.

Red oak and white ash are frequently used for axe handles in the north. Both make good handles. Sugar maple is also good for straight handles, but not for curved ones. In any case the wood should be straight-grained, smooth, and free from knots or bird pecks or other defects. Enamel-covered handles may conceal such defects.



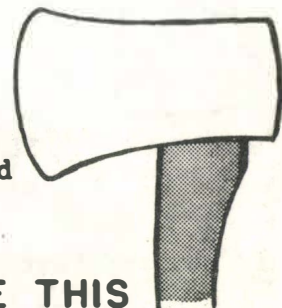
LIKE THIS



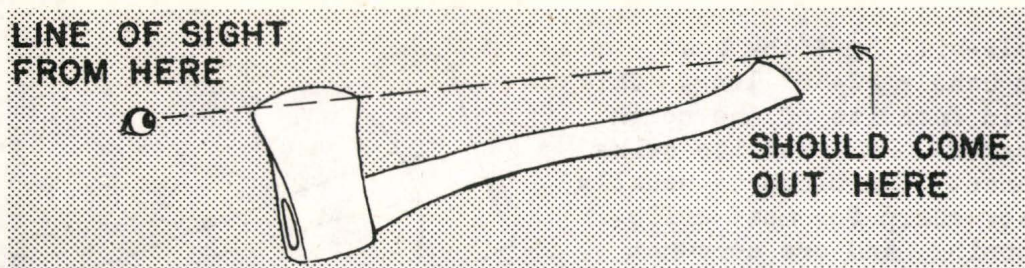
The Hang of the Axe

The axe handle should be fitted properly, with the head well down on the shoulder of the handle.

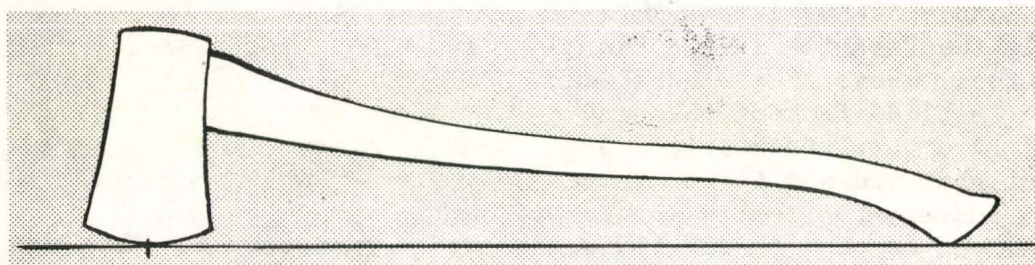
NOT LIKE THIS



Above all, the head should be aligned absolutely straight with the handle.

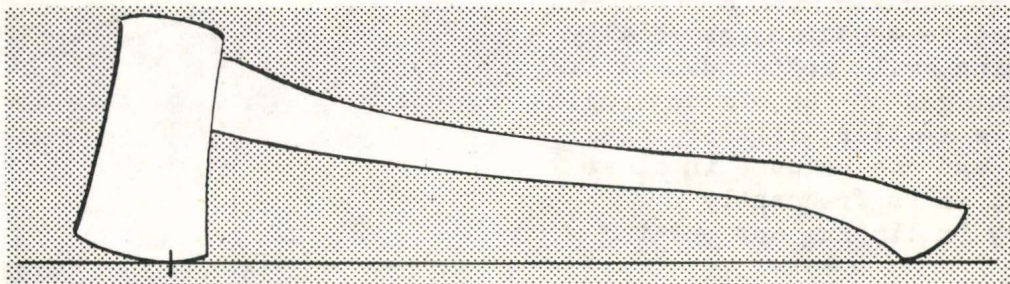


The actual "hang" of the axe is a matter of axe pattern and individual preference. Some choppers prefer the head hung so that when the axe is placed on edge on a flat surface the middle of the blade and the end of the handle touch.



The New England and Jersey single-bit and Pennsylvania double-bit patterns are adapted to this method of hanging.

The majority of choppers, however, prefer a blade hung so that contact with the flat surface is made about $\frac{2}{3}$ of the way down the blade.

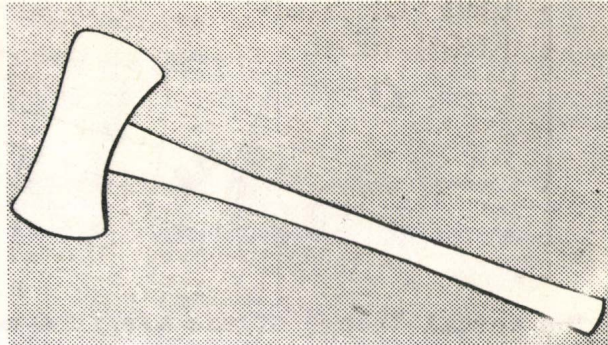


The Maine and Half Wedge single-bits and Michigan and Reversible double-bit patterns naturally hang in this manner.

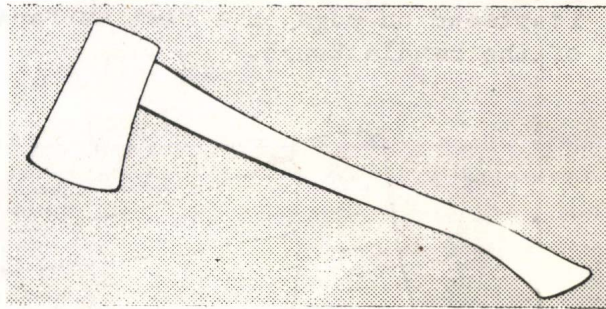
Axe Sizes

The three axe sizes most popular in the northeast are:

1. Double-bit, $3\frac{1}{2}$ -4 lb. head, straight handle 32-36" long. This is the old favorite of the north woods logger. He likes its swing and balance. One blade is usually kept razor sharp for most efficient chopping, and one somewhat "stunt" for rough work where it might hit metal or stone, or in "glass-hard" wood like frozen hemlock knots, or maple containing mineral streak.

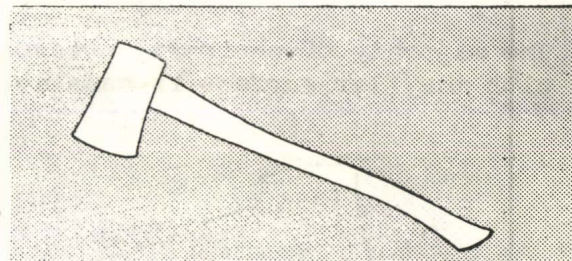


2. Single-bit, $3\frac{1}{2}$ -4 lb. head, curved handle 32-36" long. This is probably the favorite axe in the agricultural areas of the northeast. The single blade is kept thin and sharp. It can be stuck into a log or stump when the axe is not in use without endangering people around it.

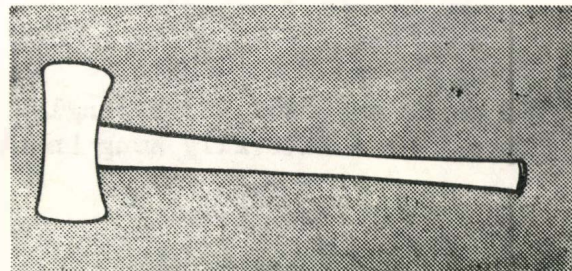


The poll can be used in driving wooden wedges and stakes. With one possible exception in which it is claimed that the axe is designed and tempered for that use, the single bit should never be used in driving steel wedges.

3. "Boy's axe" single bit, $2\frac{1}{2}$ -3 lb. head, curved handle 26-28" long. Introduced by French-Canadian pulpwood cutters, this little axe has become popular with a great many of our native woodsmen, especially for cutting small softwood. It has the advantages of the bigger single bit but is smaller, lighter, and shorter, and can be used in close quarters, as is frequently necessary in limbing and cutting brush.

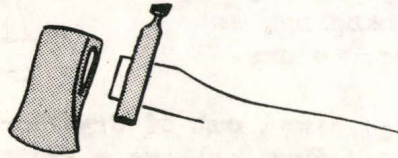


4. "Cruiser's Axe" double-bit $2\frac{1}{2}$ -3 lb. head, straight handle 26-28" long. This little axe was originally developed for use by timber cruisers and sportsmen on their treks into the woods. It is widely used on logging jobs in the small timber along the Maine coast and in southern New England.

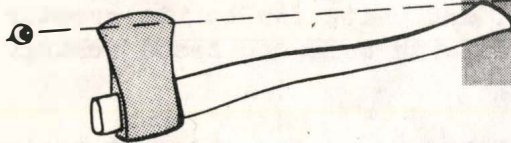


How to Put a Handle in Your Axe

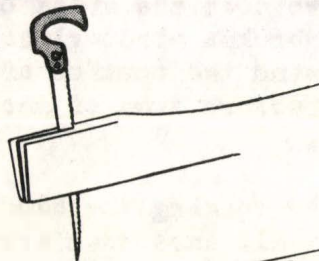
Most experienced choppers prefer to hang their own axes. Even when factory hung axes are bought and given the best of care, axe handles will break, or become loose. The various steps in putting in a new handle are shown below:



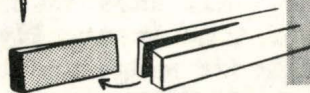
**FIT TO EYE WITH DRAW SHAVE
AND WOOD RASP**



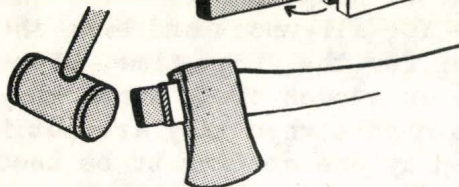
**ASSEMBLE AND TEST FOR
ALIGNMENT AND "HANG"**



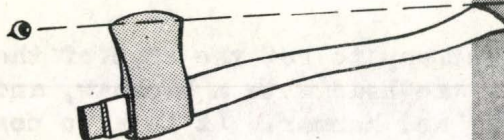
**TAKE APART AND MAKE WEDGE
SLIT WITH THIN BLADE SAW,
OR, BETTER YET, BY SPLITTING**



**SAW WEDGE FROM ANOTHER
PIECE OF DRY, STRAIGHT
GRAINED HARDWOOD**



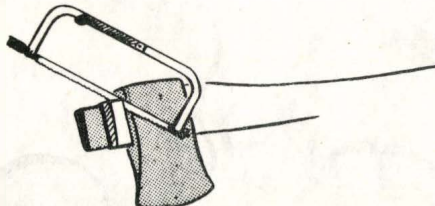
**ASSEMBLE AND DRIVE IN
WEDGE (USE WOODEN Mallet)**



TEST FOR ALIGNMENT

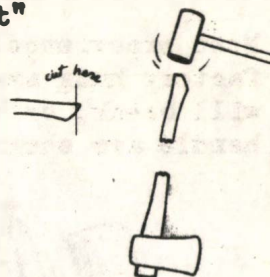


AND HANG



**SAW OFF EXCESS
(USE HACKSAW)**

It is a good idea to saw off the tip of the "deer foot" put on the end of most single-bit axe handles, to eliminate chances of splitting when putting on the head, or tightening it in later use.



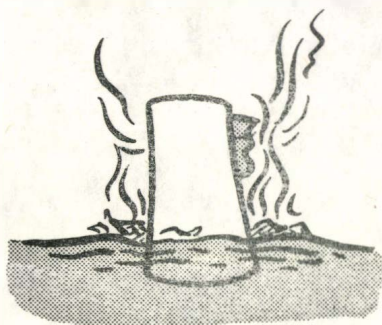
Both the handle and the wedge should be perfectly dry (5-12% moisture content) at the time of hanging, so that they will swell instead of shrinking, in use.

Northeast loggers generally prefer a wedge sawed out of dry hardwood, such as hickory, beech, oak or rock maple. They believe a softwood wedge lacks the necessary springback, and that, due to its greater shrinkage and expansion, a head wedged with softwood needs rewedging sooner.

After hanging, a great many woodsmen shave down the sides of the handle to better fit their grip with a piece of broken windowglass and then sand it with fine sandpaper. Some also wind the portion of the handle just below the head with wire or tape to absorb some of the shock in case they overreach some time in limbing.

A loose head can sometimes be tightened by soaking the handled axe head in water, or better yet, linseed oil, but all axes that are alternately wet and dry, or stored for any length of time eventually need rewedging. It is usually easy to pick out the old loose wedge and to cut a thicker one to put in its place. The same tests for alignment and hang should be given a rewedged axe as one being hung for the first time. Steel wedges have never proved as satisfactory as wooden ones, since they have no springback, and crush the wood in the handle when they are put in. Patented screw take-up wedges are offered by one company to be used along with a wooden wedge.

When an axe handle is broken the easiest way to get the stub of the old handle out is to saw it off just below the head with a hacksaw, and then drive it out backwards with a steel bar and hammer. It is also possible to burn the handle stub out if the blade is buried in the wet earth.



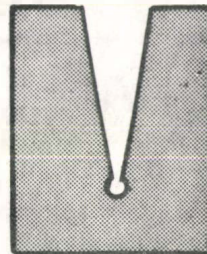
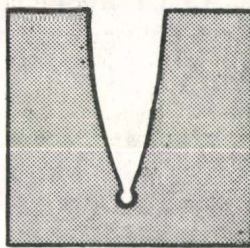
HOW TO SHARPEN YOUR AXE

Practically all axes when they come from the factory have too thick a blade. Knowing how to sharpen an axe properly and how to keep it sharp is about the most important thing that a woodsman has to learn. The tools and operations which are used in sharpening the axe are shown in the sketches below:

Beginning about an inch or an inch and a half back from the edge, the blade should be thinned down on a wet grindstone to the proper taper.

Taper will vary with the axe pattern and type of wood to be cut. Axe gauges have been devised to test when this taper has been attained. They can be made out of any heavy gauge scrap metal.

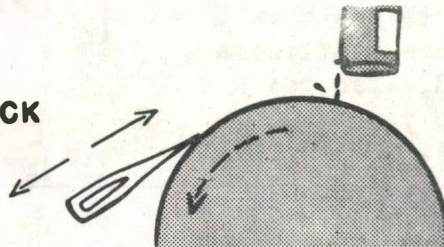
GAUGE FOR
CORRECT GRINDING
OF 3½ lb. AXE FOR
HARD WOOD OR
KNOTTY SOFT
WOOD (actual size)



GAUGE FOR
CORRECT GRIND-
ING OF 2½ lb. AXE
FOR SOFT WOOD
(actual size)

Do not use an emery wheel or a dry grindstone for this sharpening because it is more difficult to get a smooth job and you probably will ruin the temper of your axe. Use a wet, slow-rotating grindstone, and a back and forth motion on the axe as you grind it to give a smoothly-tapering edge.

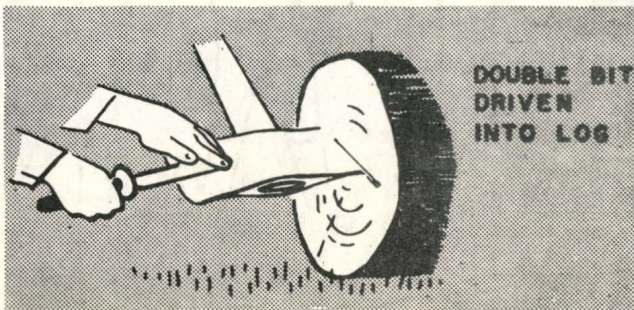
MOVE AXE BACK
AND FORTH
WHILE
GRINDING



TIN CAN OF WATER WITH
NAIL HOLE PARTIALLY
PLUGGED WITH MATCH-
STICK

The grindstone should be turned toward the axe. If turned away from it, it will cut more slowly and create a bigger burr on the edge.

The same operation can be performed, if you lack a grindstone, with a flat file as illustrated. A plywood guard, inserted over the tang before the handle is put on, will help insure against cutting the fingers.



1st POSITION for HONING



2nd POSITION



HONE WITH A
CIRCULAR
MOTION OF
STONE

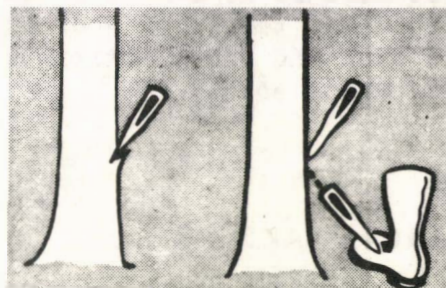


After grinding the axe should always be honed with a smooth, hard whetstone, first on one side, then the other to take off the wire edge. This is extremely important. The axe should also be honed frequently as it is used, between grindings.

AVOID CUTS —
DON'T LET FINGERS OVER —
LAP END OF STONE WHILE
HONING.

USE OF THE AXE

An axe is, or should be, a keen-edged tool. A dull axe is more dangerous to use than a sharp one. It glances off more easily. A blunt axe, improperly tapered, also has a tendency to glance off. Keep your axe sharp and use it with respect.



SHARP AXE

DULL AXE

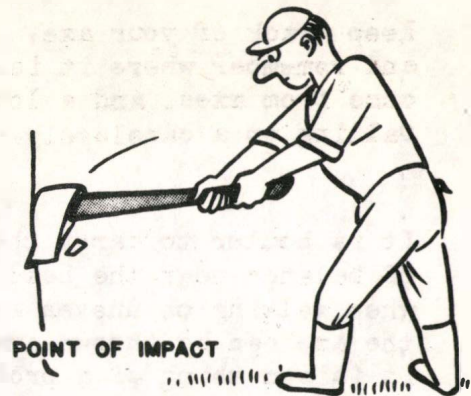
Most Americans can readily learn to chop fairly well. They are used to games that require a free and easy two-handed swing with a bat or club. Chopping, however, is an art in itself. A good axeman at work is loose and relaxed in every muscle. He holds the axe with one hand gripped just above the bulge at the end of the handle. On the up-stroke the other hand slides up the handle close to the head. On the down-stroke it slides back down the handle, until, at the point of impact, it is close to the lower hand. Each blow lands exactly where it is intended, with the proper force. There is no shock to the hands or



TOP OF AXE STROKE

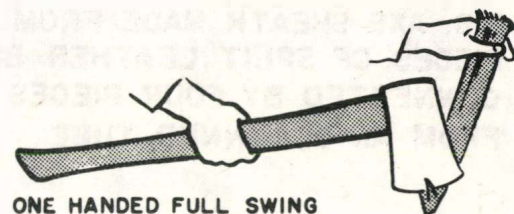
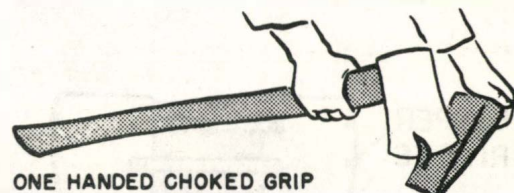
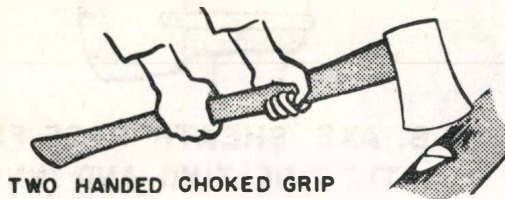
shoulders. One corner of the axe should be always free of the wood, so that a slight twist brings out the intended chip, without undue strain to the chopper or axe handle.

It is important, if at all possible, to learn to chop well over either shoulder. An ambidextrous chopper can save himself a lot of effort and trouble in his everyday work in the woods.



A number of other grips besides the full swing chopping grip illustrated above are used by the experienced axeman in his everyday work in the woods. For careful and delicate work, such as sharpening stakes, notching house logs, or some limbing he will use a two-hand choked grip, with both hands grasping near the center of the handle. For cutting brush, sharpening wooden wedges, or shaving his partner as a stunt he will use a one-hand grip at the point of balance near the axe head. And for splitting wood, cutting saplings, or sharpening stakes by himself he will use a one-hand grip, with his hand about 1/2 down the length of the handle.

Continuous, intelligent practice can make almost anyone a good chopper.



SOME WORDS OF CAUTION

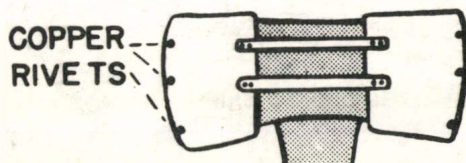
Keep track of your axe. Be careful where and how you lay it down, and remember where it is. Over a third of the accidents in the woods come from axes, and a lot of these are caused by stumbling over or falling on a carelessly-placed axe.

It is better to carry the axe in one hand with the grip at the point of balance near the head rather than over the shoulder, especially when walking on uneven woods trails. Then, if you trip or stumble, the axe can be thrown away from yourself easily and naturally, while it is something of a problem to unwrap it from around your neck.

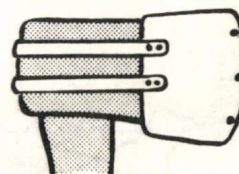
Never start chopping until you are sure that there are no branches or brush which could be struck as you swing your axe. Many bad cuts are received by an axe which has been deflected by some small branch or twig.

Never try to drive a stake or wedge with the flat side of your double-bit axe. It is almost sure to crack the eye. Never use the head of your single-bit axe to drive an iron wedge. It will batter up the head, spread the eye of the axe, and flying pieces of steel will injure the axemen or other people around him.

For long distance carrying, a simple sheath made from old leather or rubber belting will preserve the axe edge and possibly avert serious injury.



D.B. AXE SHEATH MADE FROM TWO PIECES OF SPLIT LEATHER BELT CONNECTED BY FOUR PIECES CUT FROM AN OLD INNER TUBE.



S.B. AXE SHEATH MADE FROM LEATHER BELTING AND INNER-TUBE STRIPS.

When carrying an axe in a truck or car, the head should always be sheathed or boxed.

Some Manufacturers of Axes

Commonly Used in the Northeast

	<u>First Grade Brand Name</u>
The American Fork and Hoe Co. Cleveland 15, Ohio	"True Temper" "Kelley"
Canada Foundries & Forgings, Ltd. James Smart Plant Brockville, Ontario	"444" "Empire" "Canadian"
The Collins Company Collinsville, Conn.	"Collins" "Red Seal"
Emerson and Stevens Oakland, Maine	
Mann Edge Tool Co. Lewiston, Pa.	"Knot Klipper" * "Mann's 1847" "Old Honesty" "True American"
Peavey Manufacturing Co. Brewer, Maine	"P.V."
Fayette R. Plumb, Inc. Philadelphia, Pa.	"Plumb" "Dreadnaught"
Snow and Neally Co. Bangor, Maine	"Our Best"
Spiller Axe and Tool Co. Oakland, Maine	
Warren Axe and Tool Co. Warren, Pa.	"Sager" * "Old Faithful" "Warren"

* Extra Quality, Fully Warranted.